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Pink Grasshoppers.

By SAMUEL H. SCUDDER, Cambridge, Mass.

See plate VI.

The insects commonly called grasshoppers by English speaking peoples are separated by naturalists into two great families, in one of which the antennæ are much shorter than the body and moderately thick, while in the other they are longer, often very much longer, than the body, and are exceedingly slender, tapering and thread like.

The former are generally found on the ground and as a rule are of some brown color, while the latter, at least when winged, are commonly confined to trees and bushes and are usually green. There are, however, many exceptions both as to habitat and color. The long-horned or green grasshoppers are usually green throughout, or with the exception of some minute and inconspicuous spots or streaks; but many species exist in two forms, one of which is grass-green, while the other is dead-leaf-brown, there being no difference between them, except in the general tint.

It is to this group of grasshoppers that belong all the noisy tribes of Orthoptera (excepting only the crickets), of which the

katydid is an example, and which stridulate by rubbing together the bases of the fore wings, provided for the purpose with a sort of tambourine, a tense thin membrane stiffened by cross ribs; all these songsters are males, the wings of the females being unprovided with the apparatus necessary to produce a sound. The short-horned grasshoppers stridulate but feebly, and generally by scraping their fore wings with the hind thighs—fiddle fashion.

Very rarely—it has been recorded less than a dozen times—one of these long-horned grasshoppers is found of a violet or pink color instead of green or brown. It occurs only as a rare "sport." A pair of these, belonging to the species known as *Amblycorypha oblongifolia*, are figured on our plate, painted from life, as they were feeding on the flowers of golden rod, which they devour with great zest.

The female with its sabre-like ovipositor is shown above, the male below. The female is of a pale coral red verging on magenta, the abdomen a shade paler, while the male is of an orange red. The tegmina or fore wings of the female are of a very clear color, with scarcely a single fleck of brown, while those of the male are much dotted with brown (at least as compared with what we ordinarily find in this genus) and flecked longitudinally with yellow, while the stridulating field, the tambourine, is almost entirely dull brown, and an obscure patch of the same color, more distinct on one wing than on the other, appears beyond the middle. In both, the palpi are of the color of the body, but the eyes are green and the antennæ luteous, as in normal examples.

This pair of pink grasshoppers was captured at Woods Holl, Mass., at the end of August, 1886, and other specimens were taken during the same month, one so early as the ninth of August. The first example of the sort that I ever saw was a female of another species of the same genus, *Amblycorpyha rotundifolia*, taken on Sharp Mt., Pennsylvania, at the end of August, 1878, and sent me by the late Dr. Joseph Leidy. Riley, however, records a pink specimen of *A. oblongifolia* in his Sixth Missouri Report (p. 169), and Johnson speaks of another in Science for 1889, p. 32.

Brunner, in his monograph of the subfamily Phaneropterinæ, to which these grasshoppers belong, gives instances of similar sports in other members of the same group, but I cannot learn that the phenomenon is known in Europe, which, however, possesses very few species of Phaneropterinæ, excepting such as are short winged, in which it could not appear to such advantage; but the phenomenon is not wholly confined to this group, since an example of it has been found in the true katydid, *Cyrtophyllus perspicillatus*, belonging to a distinct subfamily, Pseudophyllinæ, taken at Point Pleasant, New Jersey, 1883, as reported in the proceedings of the Philadelphia Academy by Lewis; and a species allied to it was named *rosaceus* by Stal, on account of the color of the wings in a specimen seen by him from Central America. The Pseudophyllinæ are not found in Europe.

I have never heard of this phenomenon in any other subfamily, such, for instance, as the Conocephalinæ, where we sometimes find dichromatism—green and brown varieties.

The causes which produce this curious sport among green grasshoppers are wholly unknown. The specimens I saw alive appeared quite healthy and acted in a normal manner. One thinks at once of autumn leaves and their change from green to red, and notices that these grasshopper cases all occur in the autumn, so far as known; but then it is only in the autumn that these insects mature and have their wings, and one of those taken at Woods Holl was found as early as August 9th. Even to the end of August, all residents at Woods Holl in 1886 insisted upon it that they had had no temperature at all approaching the freezing point; and finally what are we to say to Stal's *rosaceus*, taken at Chiriqui in Costa Rica? I leave these questions to the physiologists.

Preservation of Colors in Dragonflies (Odonata).

By E. B. Williamson.

The following note is offered more as a suggestion than as a statement of any positive results. The experiments were tried with only one species, *Enallagma civile*. At the time I was